To coordinate the advancement of wetland science and management on the Central Coast

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To: Chris Rose

RE: Comments to Ag Order 4.0 Options Tables

Chris, thank you for reaching out to the community as part of your efforts to update the Central Coast Agriculture Order. We believe that this dialog provides the best opportunity for all parties to work together to achieve water quality objectives while preserving the vital and productive agriculture industry of the Central Coast.

Staff with the Central Coast Wetland Group and researchers at Moss Landing Marine Labs have been active in protecting and improving water quality in California for more than 25 years and have helped develop a number of the States monitoring tools, monitoring programs, and coastal water quality and sediment data used to make decisions and set policy. More recently our group has worked to develop tools and techniques that improve water quality in the field which can be replicated in partnership with land owners at a watershed scale to make real improvements in surface water quality. We have drafted this letter (and participated in a number of staff conversations and board presentations) in hopes that our finding can be used to support the development of comprehensive policy that enables the state and industry to work together to achieve state water quality objectives.

Our comments attempt to offer insight based on our research and field observations and will aid staff efforts to develop effective policy that industry can support and adopt. We specifically aim to work with staff to identify "alternatives, off-ramps, or cooperative approaches" that industry can take to self-select site specific management measures to improve water quality and document success.

Our comments within this letter will attempt to address primarily surface water quality and habitat degradation and enhancement and not ground water impacts and drinking water which are not our expertise. As we will suggest below, we believe that groundwater contamination regulations may not pertinent in coastal valleys reliant on tile drain systems. We make the distinction between areas with perched surface water above clay layers and inland aquifer recharge areas with groundwater impacts for several reasons that are applicable for a number of low lying portions of the central coast and we recommend that these distinctions be recognized within policy.

Shallow Groundwater in Coastal River Valleys

Specifically, within the lower Salinas Valley (as well as parts of the Pajaro, Santa Maria, and Santa Clara river valleys) near the coast, agriculture thrives on flat flood plain valley soils along these rivers. Below these soils lie shallow groundwater perched above clay layers that bisect them from lower drinking and irrigation

aquifers. Because of shallow groundwater found along these river valleys, famers often use tile drain systems to artificially lower groundwater sufficiently to allow crops to grow. In these areas, shallow ground water (originating from up-valley, the ocean, adjacent fields and from those specific farms) drains through the tile drains into agriculture ditches and is then discharged into adjacent communal agriculture ditches, drainage networks and discharged to local waterways. While the possibility that some nitrate laden water is transitioning through this shallow groundwater layer and the clay layers to infiltrate lower aquifers is possible the infrastructure makes this unlikely.

Dr. Null at Moss Landing is currently investigating the sources of tile drain discharge water using nitrogen isotopes and radon signatures to help define how subsurface water mixing occurs. Once complete the research intends to identify areas where groundwater is being discharged from tile drains and thus showing positive groundwater pressure (and a low likelihood for groundwater contamination) but this study is ongoing. Regardless, because farmers have invested significant resources in tile drain systems to address shallow groundwater positive pressure it is likely that aquifer contamination processes within these coastal river valleys are different than within upper valley recharge areas where direct aquifer recharge connection has been documented. Thus, policies regarding aquifer protection should similarly reflect these variants. We therefore suggest that in areas where tile drains are used "applied nitrogen is not expected to seep below the root zone in amounts that could impact groundwater" (I will address the discharge to surface waters separately). While further study is needed to better understand shallow groundwater movement within irrigated soils, the need for tile drains to discharge high groundwater suggests an upward (or lateral) rather and downward migration of water within the soils in these areas.

Tile Drain Monitoring for Nutrient and Sediment regulation

Table 1 of the November 19 notice suggests that "all ranches must conduct surface receiving water quality monitoring, either individually or through a cooperative program" to achieve certain objectives. The Table further suggests that for farmers in areas that repeatedly exceed water quality objectives (Salinas Valley) that *"Individual Discharge to Surface Water Ranches in a subset of watershed areas that repeatedly exceed water quality objectives may be assigned individual discharge monitoring. a. Discharge flow rate and volume b. Discharge nutrient concentrations."*

As a researcher who has spent 25 years attempting to monitor nutrient discharge from various sub-watersheds and land uses of the Salinas Valley, I would like to outline some of the logistical and technical challenges associated with this type of data collection that need to be recognized as policy is being drafted and monitoring programs being developed.

Source: First, defining a ranch specific discharge is challenging for a number of reasons. In tile drain areas (where we work) "discharge" involves periodic draining of water from a number of subsurface pipes (and weeping through soils) that daylight into agriculture ditches that traverse the historical river valley floor (Figure 1). One ranch can include many tile drains and many tile drains can daylight along a ditch that parallels a ditch that may or may not drain that ranch. There are over 180 tile drains draining ditches within the one mile square area around the Old Salinas River near Castroville. Because this system of drains has been installed over the past 60 years with limited planning or documentation, it is almost impossible to

confidently document the source of water draining from any one pipe (not to mention the problematic challenges of documenting movement of shallow groundwater within the valley that ends up in these tile drains).

Figure 1. Approximate location of tile drains within the lower Salinas Valley. Blue star denotes approximate location of data collection station for Figure 2.

Flow: Measuring flow, which is critical to calculate contaminant loading, is challenging without constructing v-notch infrastructure and installing monitoring equipment or taking repeated field measurements. Most tile drains discharge haphazardly and infrequently making data collection challenging and installation of monitoring equipment on thousands of drains impractical. Hypothetically, if a monitoring program was set up to measure flow and nutrient concentration of all tile drains within the Salinas Valley monthly, data generated would include hundreds of non-detect data points along with periodic numeric values that would not represent average condition nor help describe status nor trends. Flow however can (and is) be measured at confluence points within these drainage networks effectively using electronic equipment and in some cases agriculture pumps that move water from one system to the next.

Concentrations: Nutrient concentrations within surface waters of row-crop agricultural areas are highly variable, fluctuating significantly from day to day (Figure 2, see 2006 data). Such variability makes trend analysis challenging and showing statistical improvements in water quality requires a significant investment in repeated sampling over long periods of time. For these reasons, focused monitoring at defined stations over long periods, collected by professional staff using known and appropriate methods is needed to document effects of adopted measures to improve water quality.

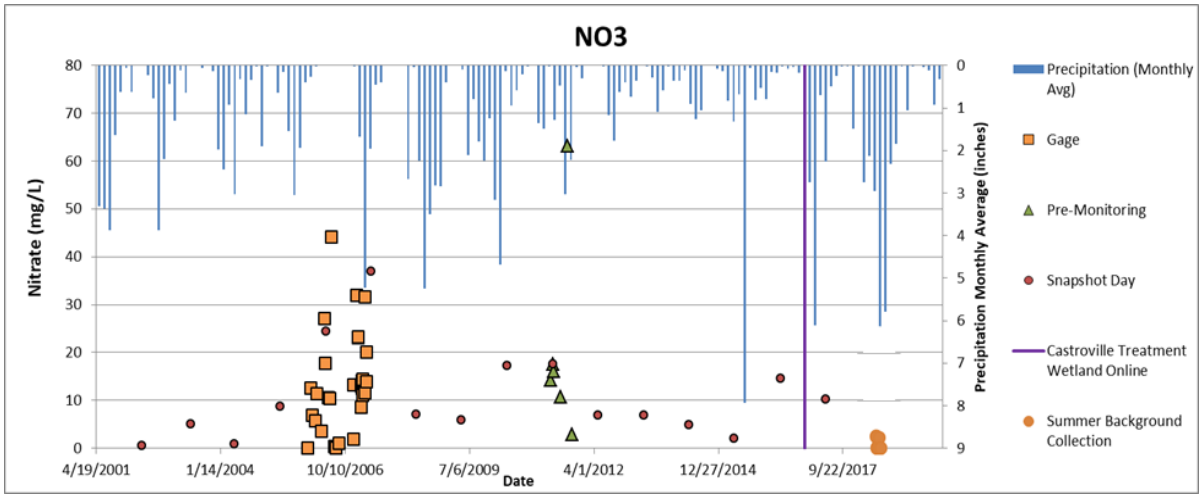

Figure 2. Nitrate down stream of Castroville Treatment System location before and after the treatment wetland was installed. Nitrate concentration is presented using several data collection efforts including the annual Snapshot Day event.

Long term data can be collected (and has) to document (concentration and load) the combine effects of on field and off-farm treatments efforts employed by farmers within defined drainage areas (Figure 2, post 2017 Castroville treatment wetland). Data collected by Preservation Inc. now provides a valuable long term data set from which the region can build to document improvements in water quality through implementation of Ag Order 4.0 or "Off-Ramped" farmer Cooperatives.

Sub-watershed monitoring with source tracking: Our field experience and research has found that documenting loading from any pipe or field within a dynamic agriculture landscape is highly problematic but documenting concentrations or loads from specific sub-watersheds and source tracking problem areas within those watersheds is possible and cost effective. Identification of sub-drainages where water quality objectives continue to exceeded objectives provides sufficient information for farmers within that drainage to work together to define the most cost effective solutions (on farm source control, off farm treatment) to address this exceedance. Success of selected actions can then be documented at the same sub-drainage sample location. We believe it is fair to assume that if incentives are given to groups of farmers within distinct drainages to meet water quality objectives, they will work to encourage "bad actors" to improve practices, and more effectively encourage their neighbors to improve than agency staff are able hundreds of miles away.

Riparian Monitoring and Management

Riparian habitat along natural waterways provides valuable habitat and water quality benefits to coastal streams. Much of this habitat has been lost over the past 110 years in central coast valleys due to

"reclamation" for agriculture and urban uses. Restoration of these habitats is possible and many dedicated groups, including our own, are working with state agencies and local land owners to implement restoration programs and improve wetland and creek habitat condition. Restoration funding is not unlimited and restoration activities require land, water and other natural resources that are limited. Therefore, strategic planning of where and how to best implement riparian restoration and streambed enhancement is needed to best improve creek habitat condition and beneficial uses throughout the central coast.

Our group has worked with the USEPA and the Central Coast Regional Board staff to develop the Riparian Rapid Assessment Method (RipRAM) for riparian habitat condition. We support its use to evaluate current riparian condition and strategically define priority areas for habitat acquisition, setbacks and restoration. Uniform setbacks (functional riparian setbacks) from surface waterbodies (which include ag drainage ditches in low lying valleys) alone will not lead to water quality attainment nor will it help improve riparian or river habitat condition. Rather we support the development of "approved watershed restoration programs" that prioritize riverine, wetland and riparian habitat restoration in areas that best support the overall condition of aquatic habitat resource of the watershed and help integrate aquatic resource management within a working agriculture landscape. Our program continues to work regionally and throughout California to develop the assessment tools and planning strategies needed to best allocate restoration dollars and resource management efforts. We plan to request USEPA funding to develop the prioritization tools needed to aid the region to prioritize riparian habitat restoration based on select environmental objectives (i.e. water quality objectives) and look forward to working closely with RB3 staff if selected for funding.

Cost share programs, mitigation fees and other mechanisms that allow farmers to group resource to improve habitat condition in strategic sections of watersheds should be investigated. Treatment wetlands and other habitat based water quality enhancement and flood management projects that have been and are implemented by groups of farmers to address nutrient loading should be credited towards these watershed habitat objectives as well.

Concessions need to be made for farmer led cooperatives and for projects that achieve water quality objectives.

One size (or three tiers) does not fit all, as has been found with implementation of Ag Order 3.0. There are many site specific and crop specific challenges to addressing water quality. Prescriptive measures can reduce nutrient loads through use of sound farming practices but site specific grower led alternatives have also been documented to lead to significant and persistent reductions in nutrient loading. These industry led alternatives should be encouraged through reductions in regulatory obligations that equal the value of the alternative actions being proposed by industry. Industry must be incentivized to achieve water quality objectives through reductions in regulatory hurdles and their associate costs and liabilities. Understanding the full costs and liabilities (i.e. uncertainties) of these regulations on the industry can aid staff to find opportunities to reduce costs for compliance and thus incentivize water quality attainment.

The current tables support this idea through reference to "off-ramps". This concept of off-ramps to lesser regulatory requirements should be aggressively leveraged and used to encourage "growers in a watershed area" to work together to establish plans to adopt on farm measures, implement cooperative treatment

systems within joint drainage areas and support receiving water monitoring to document progress towards water quality objective attainment (i.e. Figure 2).

Further, we encourage a grace period prior to the beginning of Ag Order 4.0 (aka phasing) for groups of farmers who wish to coordinate and establish watershed cooperatives, drafting plans that outline how they propose to implement initial steps to move towards meeting water quality objectives. If sufficient, these plans could enable farmers to remain within Ag. Order 3.0 guidelines along with previsions to implement the specific watershed management strategy and document incremental success. Thus incentivizing interested farmers to be active partners in achieving water quality goals based on self-directed program implementation.

The concept of self-directed implementation of water quality management measures is well supported. The California Non-Point Source Control Plan specifically stresses the implementation of a Three Tier approach with the First Tier being "Self-determined Implementation of Management Measures". Specifically the plan suggests:

> *The concept of "self-determined implementation" of NPS control measures was developed to acknowledge the potential capability of landowners and resource managers to develop and implement workable solutions to NPS pollution control and to afford them the opportunity to solve their own problems before more stringent regulatory actions are taken.*

My organization is working with numerous stakeholders (The Nature Conservancy, Monterey Bay National Marine Sanctuary, Monterey County Resource Conservation District, and Monterey County Grower Shipper Association) to establish such cooperatives groups of farmers to identify communal treatment projects that could be implemented to reduce water quality impacts to receiving waters. The greatest challenge to implementation of such cooperative efforts is not technical feasibility, nor land owner interest but regulatory incentives. We hope that Agriculture Order 4.0 will establish specific phasing that allows cooperative groups of farmers to self-organize to address water quality prior to full regulatory adherence and to incentivize additional cooperatives be established over time through viable "off-ramps" that farmers can easily take to become vested participants in improving water quality.

Treatment systems must be selected and designed by the landowner or cooperatives

Off farm treatment systems (treatment wetlands, wood chip bioreactors, etc.) have been shown to remove nutrients, sediments and pesticides from surface waters on the Central Coast. These systems require land, are expensive to construct and maintain and must be designed to function within the specific hydrologic and operational parameters of the site. Often the most appropriate location for a treatment system is off the farm or downstream of the site. These site specific requirements lead to two challenges, 1) treatment systems will only work effectively if they are designed properly and the operator is vested in their success, 2) treatment systems work best in specific locations within a drainage regardless of property or ranch boundaries. A farmer led cooperative that trades standard regulatory requirements for self-directed treatment systems within specific drainages address both these challenges.

Incentives – The Carrot for the Stick

Agriculture Order 4.0 is not the carrot but the stick. The 4.0 summary tables aptly note that there are not incentives to implementation. Incentives to water quality attainment however have been referenced within the summary documents. Specifically, alternative approaches to meeting the environmental objectives are suggested throughout the document (staff report November 8-9) but avenues to successfully take the off-ramp are not yet developed. We suggest that additional effort is made to outline how such cooperatives could be established, how farmers would establish cooperatives that establish monitoring programs, design and implement on farm and off farm treatments, estimate environmental benefits and measure success. Significant effort should be made to ensure that such self-directed approaches are successful and are effectively incentivized to achieve water quality objectives for local watersheds.

Incentives that should be developed and described include:

Phasing: Opportunity should be made (phasing) for farmers to remain in Ag Order 3.0 if they propose to establish cooperatives and draft plans to move towards achieving water quality objectives that are alternative to those proscribed within Agriculture Order 4.0.

Off-Ramps: Clear directions, maps and signage should be available for farmers and groups of farmers who find that adherence to the requirements of the Agriculture Order 4.0 are problematic and alternatives approaches that focus directly on achieving local surface water objectives become preferred.

Cooperatives: Allowing groups of farmers or land owners to select self-determine implementation of management measures to address local water quality challenges should be a priority incentive (Tier 1).

Off-Farm Treatment: Allowing a farmer or groups of farmers to meet water quality objectives (incentive) by constructing treatment systems that treat communal farm drainage prior to discharge to a receiving water can be an effective alternative to standard regulatory compliance and should be encouraged.

Cooperative monitoring: Continued support of industry led cooperative monitoring incentivizes investments in the collection of valuable data that help identify watershed scale trends and identifies problem areas. Source tracking can be integrated into this approach more effectively than any proposed ranch level monitoring program. Ranch specific monitoring is logistically challenging and technically inappropriate to generate data of value to document status, trends or violations.

Moro Cojo Pilot Cooperative: CCWG has worked with RB3 and local farmers (specifically Sea Mist Farms) to implement a number of water quality treatment systems and has collected years of data documenting the incremental improvements in water quality. We are now working with staff at the Regional Board to fully document this success and define how these improvements can be recognized within current and future policy. As the Ag Order 4.0 development process continues we encourage staff to continue to work with CCWG and Sea Mist Farms to develop the Moro Cojo as a pilot watershed cooperative where water quality has been improved based on farmer led actions, therefore testing order policy, off-ramps, incentives and demonstrating water quality success of this alternative approach.

Thank you for your consideration of our research and findings. As always CCWG is available to help RB3 staff work to improve our Central Coast environment.

Sincerely,

Ross Clark

Director